



Biocriteria in Utah

UT DWQ's Approach to Assess WQ

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'Biological Changes to WQ Standards'

'Living' Standards



vs

1983 Water Quality
Management Plan



Outline

- 1) What are bioassessment/biocriteria?
- 2) What good are they (for everyone)?
- 3) Utah Implementation:
 - WQ assessment,
 - Restoration effectiveness,
 - Stressor identification
- 4) Utah Moving Forward



What are biological assessments/criteria?

- More commonly referred to as 'bioassessments' / 'biocriteria'; they are a measure and rule of 'biological integrity'.
- 'Biological Integrity' is language first used in the Water Pollution Control Act amendments 1972 (CWA)
 - Definitions have evolved with the science; but essentially remains defined as a 'healthy' community of organisms.
- Bioassessments measure 'health', while biocriteria are standards used to define 'health'.
 - Various tools used to diagnose (assess) health; some more practical or applicable depending on objective and location



How do we establish 'health'?

Least impacted- 'Reference' locations

Think: Beautiful Mountain Stream



Why do we need biocriteria?

1. Legal Merit:

➤ Clean Water Act:

- The objective of the Clean Water Act is to restore and maintain the chemical, physical, and **biological integrity** of the Nation's waters. – Sec. 101 (a)
- It is the national goal, that wherever attainable, an interim goal of water quality which provides for the **protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water** be achieved by 1981. – Sec. 101 (a)(2)



Legal Merit Continued:

- Utah Administrative Code R317-2-6.3 & 6.5

Statute outlines the definitions of various designated beneficial uses (DBU's) including aquatic life uses for classes 3 and 5 (Aquatic life and Great Salt Lake).

For example, Class 3A -- Protected for **cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.**



Why do we need biocriteria?

2. Scientific Merit

We can measure components of biointegrity:

- Index of Biologic Integrity (IBI):
- River Invertebrate Prediction And Classification System (RIVPACS)
- Stressor Threshold Evaluations



What good are they?

1. Direct measure of the organisms in the water; WQ measure is taken during respiration
2. One of the core principles of CWA of 'fishable and swimmable'.
3. Additionally, like other standards, there's the possibility of utilizing site specific standards



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Utah Bio-Implementation

1. WQ reporting (305(b)): State of Utah's water quality
 - Define expected measures of biointegrity
 - Identification of waters not attaining DBUs
2. Nonpoint Source (319)
 - Determine effectiveness of BMPs
3. TMDL Program
 - Identify waters not attaining DBUs
 - Define endpoints necessary for success
4. Risk Assessment
 - Develop a site specific assessment and endpoint



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Where we're going?

1. Specify biocriteria
2. Consider refinement of aquatic life uses
3. Develop stressor identification and thresholds
4. Develop additional biological measuring tools
5. Inclusion of biocriteria in NPDES permitting (site specific biocriteria)



Enact Biocriteria

- Likely a narrative standard detailing appropriate use of bioassessments.
- Example: Maryland has a useful narrative biocriteria we'll consider as a starting point
- Biological standards sub-workgroup will help formulate the language



Maryland Biological Water Quality Criteria: 26.08.02.03-4

A. Quantitative assessments of biological communities in streams (biological criteria) may be used separately or in conjunction with the chemical and physical criteria promulgated in this chapter to assess whether water quality is consistent with the purposes and uses in Regulations .01 and .02 of this chapter.

B. The results of the quantitative assessments of biological communities shall be used for purposes of water quality assessment, including, but not limited to, those assessments required by §§303(d) and 305(b) of the federal Clean Water Act (33 U.S.C. §§1313(d) and 1315(b)).

C. These assessments shall use documented methods that have been subject to technical review, produce consistent and repeatable results, and are objectively interpretable.

D. In using biological criteria to determine whether aquatic life uses are being met, the Department shall allow for the uncertainty and natural variability in environmental monitoring results by using established quantitative and statistical methodologies to establish the appropriate level of uncertainty for these determinations.

E. The Department shall determine whether the application and interpretation of the assessment method are appropriate. In those instances where the Department determines the assessment method is not appropriate, it will provide its justification for that determination.



Consider refinements to aquatic life uses

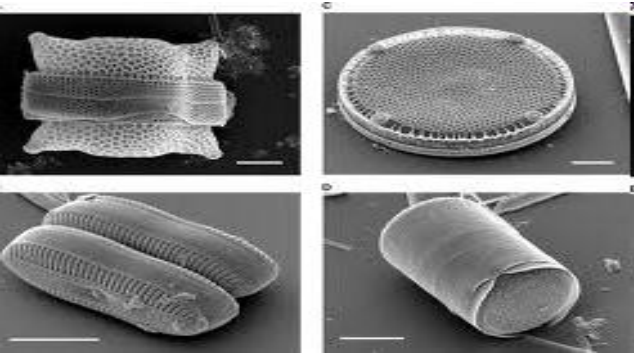
- Currently, aquatic life uses revolve around game/non-game fish communities
- There is interest to better define these uses from regulated to recreational communities
- Aquatic life uses are tied to other numeric criteria which are written into existing permits...
- Which will require a phased approach and much discussion

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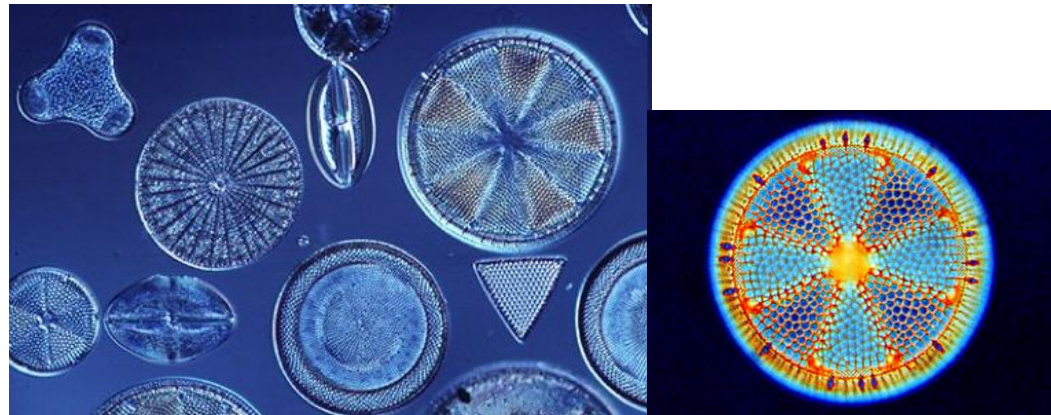
Develop stressor ID and threshold capability

- Develop procedures to highlight 'increasers' and 'decreasers'; at what tipping-point (Threshold) along a stressor gradient does the aquatic community change?
- Helps to better define numeric criteria standard (e.g. temperature); TMDLs, restoration targets
- Procedures such as outlined in EPA's CADDIS helps to systematically identify stressors impacting the aquatic community
- Targeted monitoring becomes more efficient



Incorporate additional bioassessment trophic levels

- Currently have a draft fish IBI
- Currently exploring various diatom assessment techniques
- Continued development of a physical habitat evaluation index



Inclusion of biocriteria into NPDES permits

- Currently not actively pursuing this topic; only through research
- Possibility in the future because data exists in a few permitted sectors
- Division of Oil, Gas, Mining currently evaluate mines discharging into running waters
- A few states have implemented biocriteria into decision-making for NPDES permitting (e.g. MD, FL, OH)



Questions?





Examples

- **State of Oregon: Statute 340-041-0011**
- **Biocriteria:**
 - Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.

